

## REMARKS

The Office Action dated June 12, 2003, has been carefully considered. In response thereto, the present application has been amended in a manner which is deemed to place it into consideration for allowance. Accordingly, reconsideration and withdrawal of the Office Action and issuance of a Notice of Allowance are respectfully solicited.

Claims 15, 16 and 25 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The Applicants respectfully traverse and submit that the claims are definite.

According to the language of the claims rejected on that ground, what changes the bandgap energy is plainly the varying of the thickness (claim 15, lines 1-2) or the different thickness of InP (claim 25, line 2). A person having ordinary skill in the art who had read those claims in light of the originally filed specification would have readily appreciated that a variation in thickness of the InP layer, or different thicknesses thereof, would change the bandgap energy to produce a varying or different emission wavelengths. Therefore, the claims meet the requirement of 35 U.S.C. §112, second paragraph.

The Applicants further traverse the rejection of claims 1-4, 15-16 and 23-24 under 35 U.S.C. §103(a) over *Takiguchi et al* in view of *Elman et al*, the rejection of claim 5-7 under 35 U.S.C. §103(a) over *Takiguchi et al* in view of *Elman et al* and further in view of *Yamazaki et al*, and the rejection of claim 22 under 35 U.S.C. §103(a) over *Takiguchi et al* in view of *Freundlich et al*.

According to the present claimed invention, the semiconductor layer is grown in such a way that the layer *as grown* includes defects. Also, a semiconductor layer is used, rather than a dielectric layer. The applied prior art teaches or suggests no such thing.

The Office Action relies on *Elman et al* for teaching to tune a quantum well bandgap by an intermixing technique. However, the layer of *Elman et al* is not grown in such a way that the layer *as grown* includes defects. Instead, the reference teaches that the surface 10 is implanted in a separate implantation step with a low energy ion beam to create a disordered region 11 having a depth  $R_p$  equal to the penetration depth of the ions. It is necessary to spatially separate the region 11 from the nearest quantum well layer SQW1 to prevent the defects created by ion implantation from damaging the active region 12.

Thus, the combination of references proposed in the Office Action would have resulted in a method in which the disordered region was formed by a separate implantation step. The separate region would be limited in depth to the penetration depth of the ions and would have to be spatially separated from the nearest quantum well layer. The present claimed invention, by growing the layer such that the layer *as grown* includes defects, avoids those disadvantages in a manner that would not have been obvious.

Further, with regard to claim 15 and the claims dependent therefrom, the recited range is not a range of thicknesses, but is instead a range of changes in the emission wavelength. Therefore, the argument against those claims set forth in the Office Action does not apply to the recitations of those claims.

With regard to claims 5-7, it would not have been obvious to combine *Yamazaki et al* with the other applied references in the manner suggested in the Office Action. *Yamazaki et al* teaches that an amorphous silicon film becomes easily crystallizable by plasma treatment. However, the goal of *Yamazaki et al* has nothing to do with that of the present claimed invention and in particular does not teach or suggest the use of plasma to grow a layer such that the layer *as grown* includes defects. In fact, the reference mentions defects only in the context of *correcting* them,

thereby teaching away from the present claimed invention. Therefore, none of the applied references would have conveyed to a person having ordinary skill in the art that a technique like that of *Yamazaki et al* could have been substituted for that of *Elman et al*.

Finally, with regard to claim 22, the Applicants respectfully submit that it would not have been obvious to combine *Freundlich et al* with the other applied references in the manner suggested in the Office Action. *Freundlich et al* does not teach or suggest growing a layer such that the layer as grown includes defects. Instead, the low temperatures are used only to prevent degradation of the characteristics of the cell. In fact, *Freundlich et al* has an explicit goal of leaving intact the properties of the MQW region, which runs directly counter to the present claimed invention. Therefore, the combination of references proposed in the Office Action would not have taught or even hinted at the present claimed invention.

For the reasons set forth above, the Applicants respectfully submit that the present claimed invention is patentable over the combinations of references set forth in the Office Action.

As all grounds of objection and rejection have been addressed and overcome, issuance of a Notice of Allowance of the claims as now presented is respectfully solicited.

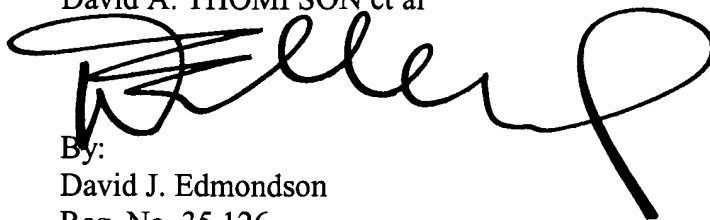
In the event there are any questions relating to this Response or to the application in general, it would be appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that prosecution of this application may be expedited.

Please charge any shortage of fees or credit any overpayment thereof to BLANK ROME LLP, Deposit Account No. 23-2185 (115354-00116). In the event that a separate Petition for an Extension of Time is required to render this submission timely and either does not accompany this Response or is insufficient to render this Response timely, the Applicant herewith petitions

under 37 C.F.R. §1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized above.

Respectfully submitted,

David A. THOMPSON et al

A large, stylized handwritten signature in black ink, likely belonging to David J. Edmondson, written over the printed name.

By:  
David J. Edmondson  
Reg. No. 35,126

BLANK ROME L.L.P.  
Watergate 600, 11<sup>th</sup> Floor  
600 New Hampshire Ave., N.W.  
Washington, D.C. 20037-2485  
Telephone 202-772-5838 (direct dial) or 5800 (main)  
Facsimile 202-572-1438 (direct) or 8398 (practice group)